6. IC Block Diagrams

1. AK4534

= Target Spec =

AK4534

16Bit ΔΣ CODEC with MIC/HP/SPK-AMP

GENERAL DESCRIPTION

The AK4534 is a 16bit stereo CODEC with a built-in Microphone-Amplifier, Headphone-Amplifier and Speaker-Amplifier. Input circuits include Microphone-Amplifier and ALC (Auto Level Control) circuit. And output circuits include Headphone-Amplifier and Speaker-Amplifier. Therefore the AK4534 suits a PDA. The package of AK4534VQ is 48pin LQFP and the package of AK4534VN is 52pin of QFN. A new system can be smaller board area than a current system is composed of 2 or 3 chips.

FEATURES

1. Resolution : 16bits
2. Recording Function
   - 1ch Mono Input
   - ∑1st MIC Amplifier : 20dB or 0dB
   - 2nd Amplifier with ALC : -8dB ~ +27.5dB, 0.5dB Step, Mute
   - ADC Performance : S/(N+D) : 70dB, DR, S/N : 80dB
3. Playback Function
   - Digital De-emphasis Filter (tc=50/15ms, fs=32kHz, 44.1kHz, 48kHz)
   - Digital Volume (0dB ~ -127dB, 0.5dB Step, Mute)
   - Headphone-Amp
     - HP-AMP Performance : S/(N+D) : 70dB, S/N : 88dB
     - Output Power : 15mW@16W (HVDD=3.3V)
       (Required external 6.8W series resistor)
   - Mono Speaker-Amp with ALC
     - SPK-AMP Performance : S/(N+D) : 50dB, S/N : 85dB
     - BTL Output
     - Output Power : 150mW@8W (HVDD=3.3V)
   - Mono and Stereo Beep Input
   - Mono Line Output
4. Power Management
5. Master Clock
   (1) PLL Mode
   - Frequencies : 11.2896MHz, 12MHz and 12.288MHz
   - Input Level : CMOS

   (2) External Clock Mode
   - Frequencies : 2.048MHz ~ 12.288MHz
6. Output Master Clock Frequencies : 32fs/64fs/128fs/256fs
7. Sampling Rate
   (1) PLL Mode
   - 8kHz, 11.025kHz, 16kHz, 22.05kHz, 24kHz, 32kHz, 44.1kHz, 48kHz

   (2) External Clock Mode
   - 8kHz ~ 48kHz
8. Control mode: 4-wire Serial / I2C Bus
9. Master/Slave mode
10. Audio Interface Format : MSB First, 2ís compliment
    - ADC : I2S, 16bit MSB justified
    - DAC : I2S, 16bit MSB justified, 16bit LSB justified
11. Ta = -10 ~ 70∝C

12. Power Supply:

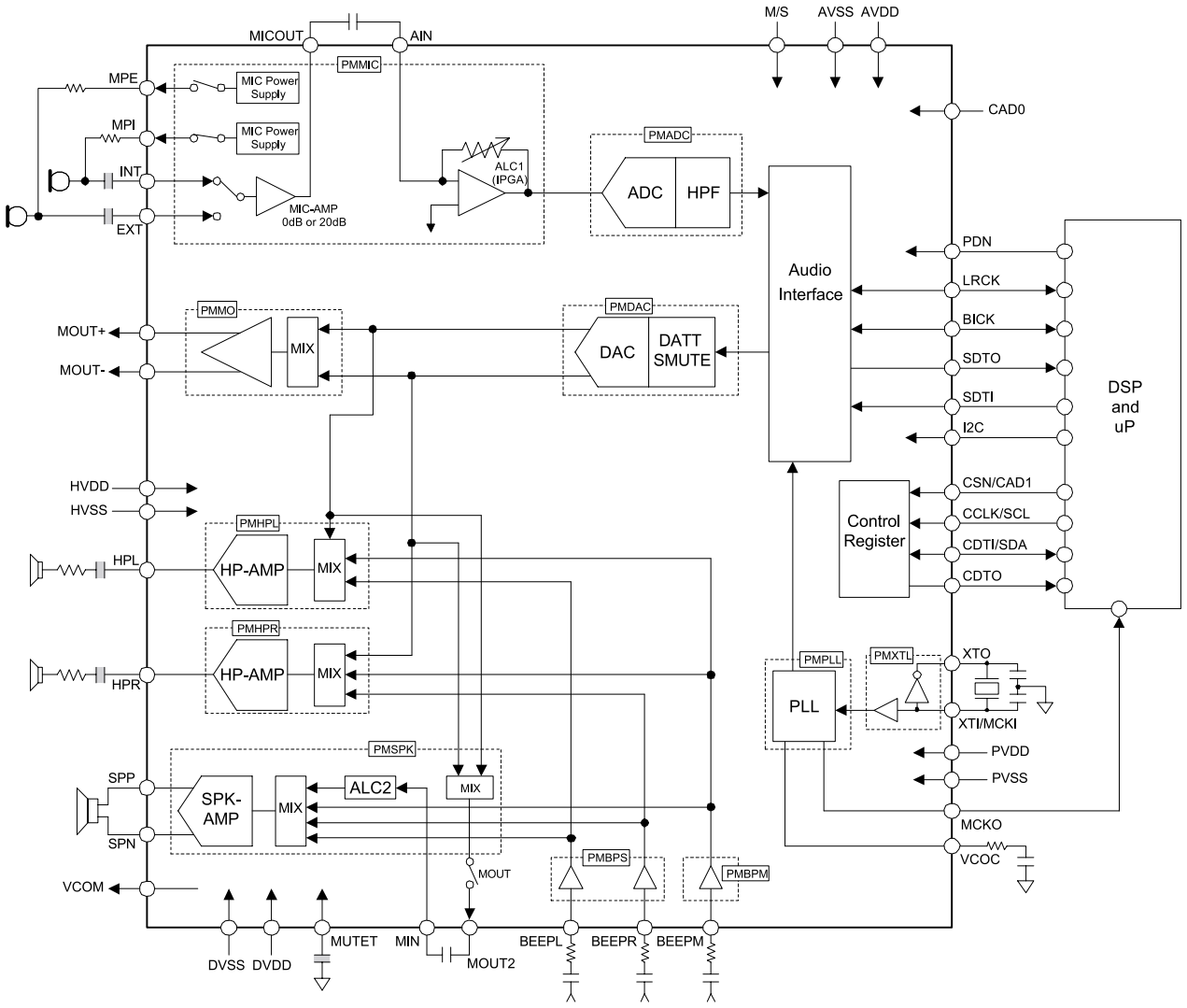
- ∑CODEC : 2.4V ~ 3.6V (typ. 3.3V)
- ∑PLL : 2.4V ~ 3.6V (typ. 3.3V)
- ∑Headphone-Amp : 2.4V ~ 3.6V (typ. 3.3V)
- ∑Speaker-Amp : 2.4V ~ 3.6V (typ. 3.3V)

13. Power Supply Current

- AVDD+DVDD : 20mA
- PVDD : 2mA
- HVDD (HP-AMP=ON, SPK-AMP=OFF) : 8mA
- HVDD (HP-AMP=OFF, SPK-AMP=ON) : 9mA

14. Package : 48pin LQFP / 52pin QFN

■ Block Diagram

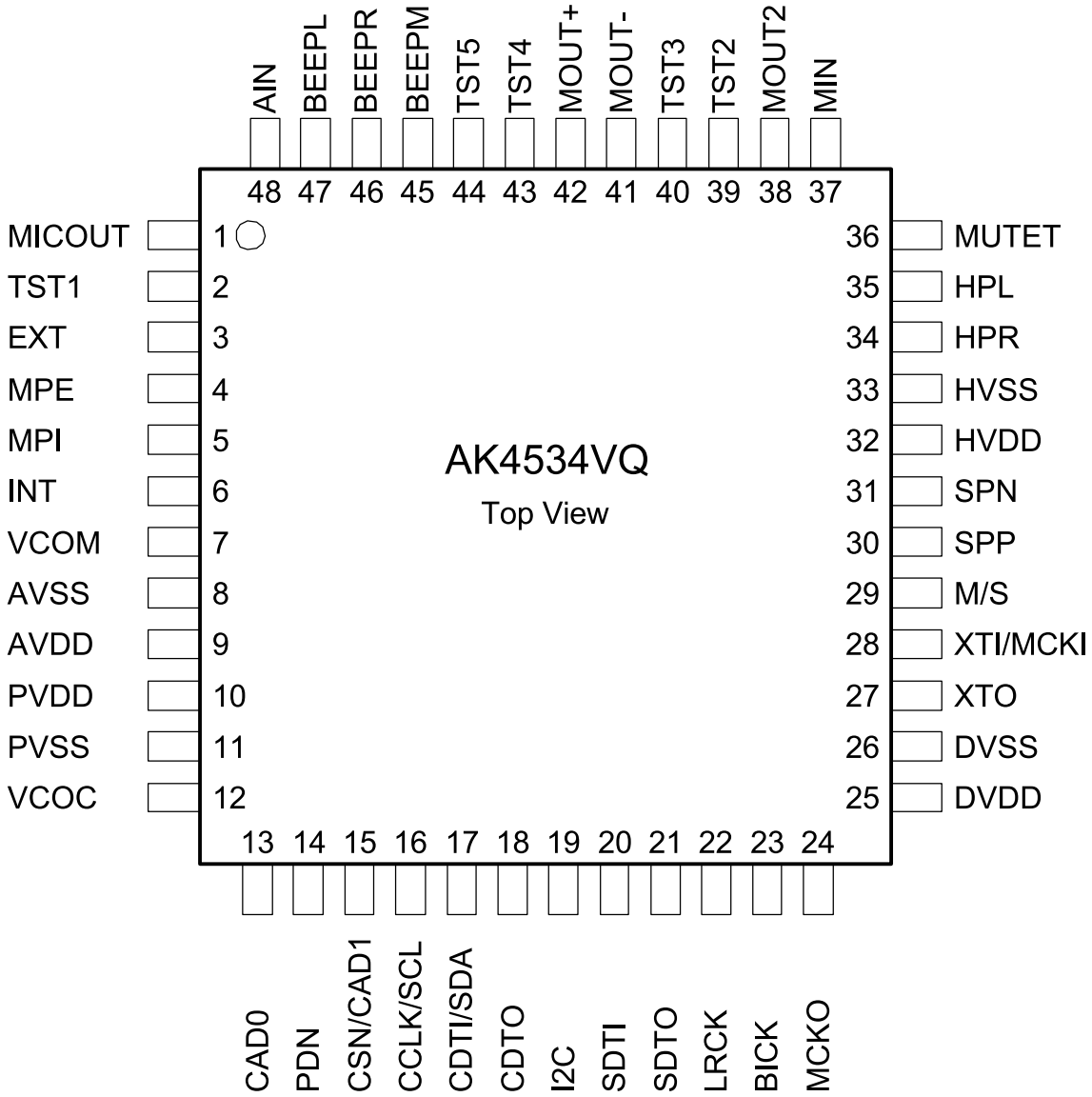


Block Diagram

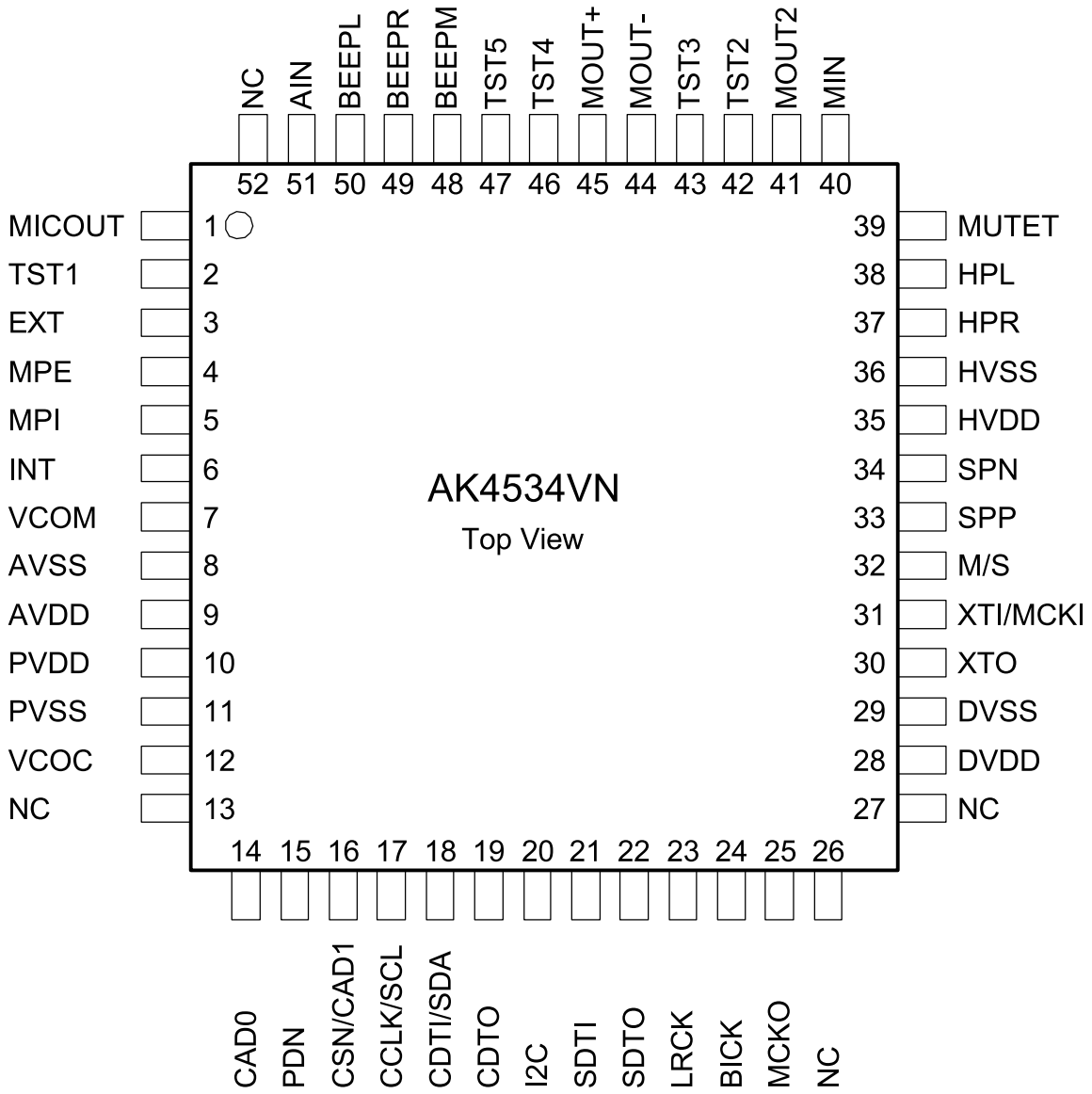
■ Ordering Guide

AK4534VQ	−10 ~ +70°C	48pin LQFP (0.5mm pitch)
AK4534VN	−10 ~ +70°C	52pin QFN (0.4mm pitch)
AKD4534	Evaluation board for AK4534	

■ Pin Layout (48pin LQFP)



■ **Pin Layout (52pin QFN)**



19-1198; Rev 0; 4/97

EVALUATION KIT MANUAL AVAILABLE

MAXIM

1- to 3-Cell, High-Current, Low-Noise, Step-Up DC-DC Converters with Linear Regulator

General Description

The MAX1705/MAX1706 are high-efficiency, low-noise, step-up DC-DC converters with an auxiliary linear-regulator output. These devices are intended for use in battery-powered wireless applications. They use a synchronous rectifier pulse-width-modulation (PWM) boost topology to generate 2.5V to 5.5V outputs from battery inputs, such as 1 to 3 NiCd/NiMH cells or 1 Li-Ion cell. The MAX1705 has an internal 1A N-channel MOSFET switch. The MAX1706 has a 0.5A switch. Both devices also have a built-in low-dropout linear regulator that delivers up to 200mA.

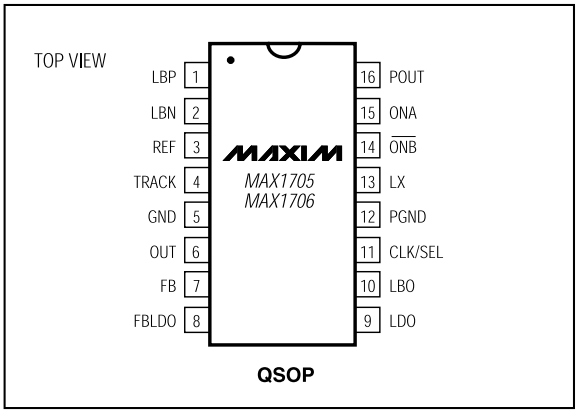
With an internal synchronous rectifier, the MAX1705/MAX1706 deliver 5% better efficiency than similar non-synchronous converters. They also feature a pulse-frequency-modulation (PFM) standby mode to improve efficiency at light loads, and a 1μA shutdown mode. An efficiency-enhancing track mode reduces the step-up DC-DC converter output to 300mV above the linear-regulator output.

Both devices come in a 16-pin QSOP package, which occupies the same space as an 8-pin SO. Other features include two shutdown-control inputs for push-on/push-off control, and an uncommitted comparator for use as a voltage monitor.

Applications

Digital Cordless Phones
Personal Communicators
Palmtop Computers
Hand-Held Instruments
PCS Phones
Wireless Handsets
Two-Way Pagers

Pin Configuration

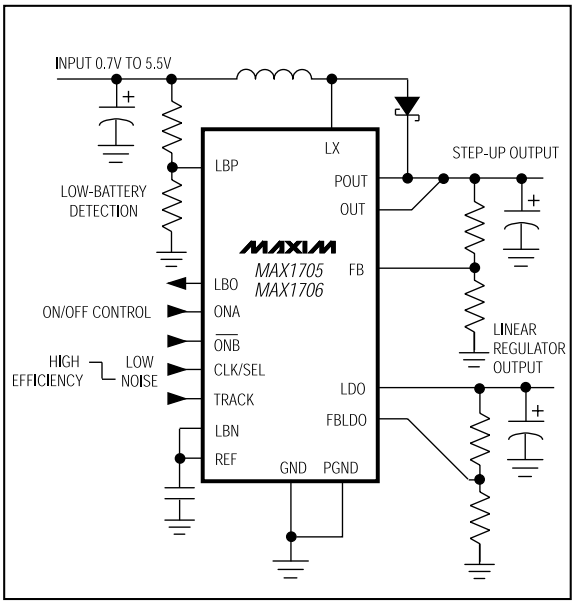


Features

- **Up to 96% Efficiency**
- **1.1V$_{IN}$ Guaranteed Start-Up**
- **Up to 850mA Output (MAX1705)**
- **Step-Up Output (2.5V to 5.5V adjustable)**
- **Linear Regulator (1.25V to 5.0V adjustable)**
- **PWM/PFM Synchronous-Rectified Topology**
- **300kHz PWM Mode or Synchronizable**
- **1μA Shutdown Mode**
- **Voltage Monitor**
- **Pushbutton On/Off Control**

Ordering Information

PART	TEMP. RANGE	PIN-PACKAGE
MAX1705C/D	0°C to +70°C	Dice*
MAX1705EEE	-40°C to +85°C	16 QSOP
MAX1706C/D	0°C to +70°C	Dice*
MAX1706EEE	-40°C to +85°C	16 QSOP

Dice are tested at T_A = +25°C, DC parameters only.

Typical Operating Circuit